

## REMARKS

### **I. Status of Claims**

Newly added claims 15-23 are currently pending in this application. Claims 15-17, 19, and 21 are independent. By this amendment, claims 1-14 are canceled without prejudice to and/or disclaimer of the subject matter therein.

Claims 1-12 were rejected under 35 U.S.C. 102(b) as being allegedly anticipated by Banhardt *et al.*, DE 101 27 322 (hereinafter “Banhardt”). Claims 1-3 and 12-14 were rejected under 35 U.S.C. 102(b) as being allegedly anticipated by Yamamoto, JP 10-172586 (hereinafter “Yamamoto”). Claims 1-12 were rejected under 35 U.S.C. 102(e) as being allegedly anticipated by Debe *et al.*, USP 6,780,536 (hereinafter “Debe”). Claims 1-12 were rejected under 36 U.S.C. 102(b) / 103(a) as being allegedly anticipated by, and alternatively allegedly unpatentable over Kosugi *et al.*, JP 2001-043870 (hereinafter “Kosugi”).

The Applicant respectfully requests reconsideration in view of the foregoing amendments and the following remarks.

### **II. Pending Claims**

Claim 15 is a combination of original claims 1 and 8. Claim 8 was originally rejected by Banhardt, Debe, and Kosugi. Claim 16 is a combination of original claims 1 and 13. Claims 18 and 20 have related claim language to claim 16. Claim 13 was originally rejected by Yamamoto.

#### **i. Newly submitted claims 15 is patentable over Banhardt, Debe, and Kosugi**

Claim 15 is patentable over the cited references at least because it recites “wherein the gas passage groove includes a curved portion which is a transition portion between a side surface of the gas passage groove and a bottom surface of the gas passage groove, and the cross-sectional area of the gas passage is changed by changing a radius of curvature of at least one curved portion.”

First, with respect to Banhardt, this reference simply does not disclose that the cross-sectional area of the gas passage is changed by changing the radius of curvature of a curved portion.

Second, regarding Debe, as shown in FIG. 9, the opening width of the gas passage changes in the direction gas passage extends. That is, the technique is different from the present application. Further, Debe does not disclose or suggest that the cross sectional area of the gas passage is changed

by changing the radius of curvature of a curved portion.

Third, with respect to Kosugi, the opening width varies; however, in the present application the opening width of the gas passage groove remains substantially constant. In the Abstract, Kosugi describes that “the opening width at the upstream is narrow, and that at the downstream is wide.

Further, Kosugi’s conventional separator passage structure of the fuel cell has the following drawbacks. Because the cross sectional area of the gas passage is changed by changing the opening width of the gas passage, the width of the contact area of the electrode with the separator convex rib changes, therefore, it becomes difficult to maintain the homogeneity of the reaction in the entire cell.

The Applicant respectfully submits that for at least these reasons, claim 15 is patentable over the cited references.

**ii. Claims 16, 18, and 20 are patentable over Yamamoto**

Claims 16 and 18 are patentable over the cited references at least because they recite “wherein the cross-sectional area of the gas passage being changed by changing a thickness of a surface treatment layer of the gas passage groove.”

Claim 20 is patentable over the cited references at least because it recites “forming on the surface of each respective gas passage groove a surface treatment layer having a changing thickness in the longitudinal direction of each respective gas passage groove so that the cross-sectional area of each respective gas passage groove being changed in the extending direction thereof.”

Yamamoto regards a fuel cell construction that using a high water absorbing polymer sheet, varies a flow pass cross-sectional area, according to the water absorption amount of the polymer sheet. When the polymer sheet is dried, its volume reduces and the flow pass cross-sectional area expands, thus decreasing the gas velocity. But, this construction has drawbacks. Absorption and release of the water to/from the polymer sheet causes tremendous change in the flow pass cross-sectional area. Due to the operation of the fuel cell, the volume of the water absorbing polymer sheet changes, so, it is difficult to control the flow pass cross-sectional area properly. In addition, Yamamoto does not disclose or suggest the thickness of the water absorbing polymer sheet.

In contrast to Yamamoto, the cross sectional area of a gas passage of the present application is changed by changing the surface treatment thickness. Thus, during the fuel cell operation, it is possible to maintain homogeneous gas all over the cell.

The Applicant respectfully submits that for at least these reasons, claims 16, 18, and 20 are patentable over the cited references.

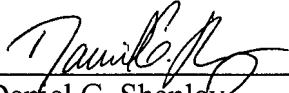
### **III. Conclusion**

In view of the foregoing discussion, the Applicants respectfully submit that the present application is in all aspects in allowable condition. Favorable reconsideration and early issuance of a Notice of Allowance are therefore respectfully requested.

The Examiner is invited to contact the undersigned at (202) 220-4420 to discuss any matter concerning this application. The Office is authorized to charge any fees related to this communication to Deposit Account No. 11-0600.

Respectfully submitted,

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Daniel G. Shanley  
Registration No. 54,863

Kenyon & Kenyon LLP  
1500 K Street, N.W. - Suite 700  
Washington, D.C. 20005 - 1257  
Telephone: (202) 220-4200  
Facsimile: (202) 220-4201